What is claimed is:

1. A method of producing chemical cellulose pulp from comminuted cellulose fibrous material using a continuous digester having an inlet, comprising the steps of:

(a) continuously feeding comminuted cellulose fibrous material in a liquid slurry to the inlet to the continuous digester; and

(b) cooking the material in the digester for more than thirty minutes at a temperature between about 140°–190° C., before the cook is terminated; and

wherein step (b) is practiced so that during at least the last minute before the cook is terminated the effective alkali concentration, expressed as NaOH or equivalent, in the digester is between 20–50g/l.

2. A method as recited in claim 1 wherein step (b) is practiced so that during at least the last 15 minutes before the cook is terminated the effective alkali concentration is between about 21–35 g/l.

3. A method as recited in claim 1 wherein step (b) is practiced so that during at least the last 30 minutes before the cook is terminated the effective alkali concentration is between about 25–35 g/l.

4. A method as recited in claim 1 wherein step (b) is practiced by: at least at first and second locations removing liquid from the slurry, the first location being closest to the digester inlet; and adding fresh alkali; and wherein more than 50% of the total alkali added to the slurry during the entire practice of steps (a) and (b) is added after the first location.

5. A method as recited in claim 4 wherein said step of adding alkali after the first location is practiced at more than two different locations, and added so that the highest effective alkali concentration during the practice of step (b) is less than 35 g/l.

6. A method as recited in claim 4 wherein step (b) is practiced in at least two different stages, a first stage closer to the digester inlet, and a second stage further from the digester inlet; and wherein said second stage is a counter-current cooking stage.

7. A method as recited in claim 1 wherein step (b) is practiced by: at least at first and second locations removing liquid from the slurry, the first location being closest to the digester inlet; and adding fresh alkali; and wherein more than 70% of the total alkali added to the slurry during the entire practice of steps (a) and (b) is added after the first location.

8. A method as recited in claim 7 wherein said step of adding alkali after the first location is practiced so that the highest effective alkali concentration during the practice of step (b) is less than 35 g/l.

9. A method as recited in claim 8 wherein after an alkali addition after the first location at least 7% on wood of effective alkali is consumed by the cellulose material.

10. A method as recited in claim 1 wherein step (b) is practiced by: at least at first and second locations removing liquid from the slurry, the first location being closest to the digester inlet; and adding alkali; and wherein more than 80% of the total fresh alkali added to the slurry during the entire practice of steps (a) and (b) is added after the first location.

11. A method as recited in claim 10 wherein said step of adding alkali after the first location is practiced at more than two different locations, and added so that the highest effective alkali concentration during the practice of step (b) is less than 35 g/l.

12. A method as recited in claim 11 wherein after an alkali addition after the first location at least 9% on wood of effective alkali is consumed by the cellulose material.

13. A method as recited in claim 1 wherein step (b) is practiced in at least two different stages, a first stage closer to the digester inlet, and a second stage further from the digester inlet; and wherein said second stage is a counter-current cooking stage.

14. A method as recited in claim 13 wherein the second cooking stage is the last cooking stage, and is counter-current, and wherein during the last minute before the cook is terminated in the second, counter-current, cooking stage the effective alkali concentration expressed as NaOH or equivalent is between 20–35 g/l.

15. A method as recited in claim 1 comprising the further step of subjecting the material to a counter-current wash to substantially terminate the cook before discharge of the material from the continuous digester.

16. A method of producing chemical pulp having enhanced intrinsic fiber strength from comminuted cellulosic fibrous material, comprising the steps of continuously and sequentially:

(a) treating the comminuted cellulosic fibrous material with a first cooking liquor having a first effective alkali concentration which is greater than 10 g/l;

(b) further treating the material with the first cooking liquor so as to consume alkali from the first cooking liquor, so that the effective alkali concentration of the spent first liquor is reduced to about 10 g/l or less;

(c) extracting the spent first cooking liquor from the material;

(d) treating the material with a second cooking liquor having a second effective alkali concentration greater than about 25 g/l and greater than the first concentration, the second cooking liquor providing at

least 50% of the total fresh alkali to be consumed by the material in the production of chemical pulp;

(e) cooking the material with the second cooking liquor at cooking temperature to produce chemical pulp and a spent second cooking liquor having an effective alkali concentration expressed as NaOH or equivalent of greater than about 20 g/l; and

(f) extracting the spent second cooking liquor from the pulp in the digester; and

wherein step (e) is practiced for more than 30 minutes. and wherein during at least the last fifteen minutes the effective alkali concentration expressed as NaOH or equivalent is between 20–40 g/L so as to produce chemical pulp having enhanced intrinsic fiber strength compared to if the effective alkali concentration was below 15 g/l during the last fifteen minutes of step (e).

17. A method as recited in claim **16** wherein during at least the last fifteen minutes the effective alkali concentration is between 25–35 g/L.

18. A method as recited in claim **17** wherein about 80% or more of the total amount of white liquor and total fresh alkali to be used to produce the pulp is added in step (d) as the second cooking liquor.

19. A method as recited in claim **17** wherein steps (d) and (e) are practiced in a counter-current cooking stage.

20. A method as recited in claim **16** wherein steps (d) and (e) are practiced in a counter-current cooking stage.

21. A method as recited in claim **16** wherein step (b) is practiced to consume at least 7% on wood of effective alkali.

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22. A method for producing pulp, comprising the steps of:

providing a fiber material, a transport liquid and an impregnation zone;

providing a digester to facilitate a cooking reaction, the digester having at least one screen girdle section disposed therein, the digester having a first cooking zone and a second cooking zone;

providing a total amount of cooking liquor required for the cooking reaction;

transporting the fiber material and the transport fluid to the impregnation zone;

heating and impregnating the fiber material disposed in the impregnation zone;

transferring the heated and impregnated fiber material from the impregnation zone to the first cooking zone;

supplying a first portion of the total amount of the cooking liquor to the impregnation zone and the first cooking zone;

obtaining a first effective alkali concentration in the first cooking zone;

passing the fiber material and the cooking liquor through the first cooking zone; and

supplying a second portion of the total amount of the cooking liquor to the second cooking zone to obtain a second effective alkali concentration in the second cooking zone, the second alkali concentration being between about 8 grams/liter and about 120 grams/liter greater than the first effective alkali concentration.

23. The method according to claim 22 wherein the method is a continuous process.

24. The method according to claim 22 wherein the method further comprises the steps of withdrawing a spent liquor from the screen girdle section and transferring the spent liquor to the impregnation zone.

25. The method according to claim 22 wherein the second alkali concentration is at least about 14 grams/liter greater than the first effective alkali concentration.

26. The method according to claim 22 wherein the second alkali concentration is between about 20 grams/liter and about 50 grams/liter greater than the first effective alkali concentration.

27. The method according to claim 22 wherein the second alkali concentration is between about 30 grams/liter and about 40 grams/liter greater than the first effective alkali concentration.

28. The method according to claim 22 wherein the second effective alkali is between about 14 g/l and about 70 g/l.

29. The method according to claim 28 wherein the second effective alkali is between about 20 g/l and about 50 g/l.

30. The method according to claim 22 wherein the first portion is at least 40% of a total amount of effective alkali charged.

31. The method according to claim 22 wherein the second portion is at least 30% of a total amount of the effective alkali charged.

32. The method according to claim 22 wherein the first cooking zone is heated to a first temperature and the second cooking zone is heated to a second temperature, the first temperature being greater than the second temperature.

33. The method according to claim 22 wherein the first temperature is at least 20° C. greater than the second temperature.

34. The method according to claim 22 wherein the first temperature is between about 150° C. and about 170° C.

35. The method according to claim 22 wherein the second temperature is between about 130° C. and about 150° C.

36. The method according to claim 22 wherein the second cooking zone is a counter-current cooking zone.

37. The method according to claim 22 wherein the second cooking zone is a concurrent cooking zone.

38. The method according to claim 37 wherein the second portion is between about 16% and about 100% of a total amount of effective alkali charged.

39. The method according to claim 37 wherein the second portion is between about 28% and about 100% of the total amount of effective alkali charged.

40. The method according to claim 39 wherein the second portion is between about 40% and about 90% of the total amount of effective alkali charged.

41. The method according to claim 22 wherein the first cooking zone has an H-factor that is between about 30% and about 99.5% of a total H-factor required for a pulp formation.

42. The method according to claim 22 wherein the first cooking zone has an H-factor that is between about 50% and about 99% of a total H-factor required for a pulp formation.

43. The method according to claim 22 wherein the first cooking zone has an H-factor that is between about 60% and about 98% of a total H-factor required for a pulp formation.

44. A method for producing pulp, comprising the steps of:

providing a total amount of cooking liquor;

providing a digester containing a fiber material to facilitate a cooking reaction;

supplying a first portion of the total amount of the cooking liquor to the digester;

obtaining a first effective alkali level in the digester;

heating the fiber material disposed in the digester to a first temperature;

cooking the fiber material in a first cooking stage to initiate a pulp formation, the first cooking stage having an H factor that is between about 60% and about 98% of a total H-factor required to complete the pulp formation;

completing the first cooking stage;

supplying a second portion of the total amount of the cooking liquor to a second cooking stage;

obtaining a second effective alkali level in the second cooking stage, the second effective alkali level being between about 8 grams per liter and about 60 grams per liter greater than the first effective alkali level; and

cooking the fiber material from the first cooking stage at a second temperature until the pulp formation is completed.

45. The method according to claim 44 wherein the method further comprises the steps of withdrawing a spent liquor after the first cooking stage and using the spent liquor to pre-treat the fiber material prior to the second cooking stage.

46. The method according to claim 44 wherein the method further comprises the step of terminating the second cooking stage by introducing a washing liquid into the digester and the washing liquid has a temperature that is lower than the second temperature.